

GAUTAM THATTE

PERSONAL INFORMATION

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United States Citizen

EDUCATION

PhD, Electrical Engineering 2004 – 2010
University of Southern California, Los Angeles, CA GPA 3.91

Thesis Advisor: Urbashi Mitra

Title: Applications of Estimation and Detection Theory in Decentralized Networks

Abstract: Three applications of decentralized networks in increasingly complex detection frameworks were considered: unconstrained binary detection in computer networks, constrained binary detection in wireless sensor networks, and M-ary detection in wireless body area networks. In each of these applications, the interactions between estimation and detection components, as well as any constrained resources, were investigated.

MS, Electrical Engineering 2003 – 2004
University of Southern California, Los Angeles, CA GPA 3.98

BS, (General) Engineering *with Distinction* 1999 – 2003
Harvey Mudd College, Claremont, CA GPA 3.68

EXPERIENCE

Alonzo & Associates, El Segundo, CA 2009 – 2011
Technical Analyst

- Analyzed patent applications from a qualitative perspective to determine technical novelty and scope of the proposed invention
- Proposed modifications and extensions to the invention definitions
- Drafted 450+ informative reports clarifying and summarizing analyses for national and international patent prosecution
- Specialized in critical fields of wireless communications: routing protocols, handoff methods, interference cancellation, multiple access techniques including OFDMA and CDMA, diversity techniques, MIMO communication methods, circuit theory, digital and analog communication systems, error correction coding, and adaptive equalization

University of Southern California 2004 – 2010
Research Assistant

Detection of network anomalies

- Developed models for the presence of anomalies in real internet traffic, which were used to drive the design of algorithms for denial of service attack and other anomaly detection

- Validated methods using synthetic and real traces, and real time deployment, achieving detection times of a few seconds for low-rate attacks

Performance optimization in wireless body area networks

- Developed an optimal time-resource allocation scheme for wireless body area sensing networks for physical activity detection
- Validated theoretical methods on an implementation of the wireless body area network employing accelerometer, heart monitor and pulse oximeter sensors achieving an energy savings of 10% over traditional allocation methods

Power allocation in sensor networks

- Investigated optimal power allocation for parameter estimation in sensor networks for tree and linear topologies via minimizing the mean-squared error under a total network power constraint
- Evaluated trade-off between channel quality and measurement noise to maximize energy efficiency, resulting in a subset of sensors remaining inactive

Harvey Mudd College

2002 – 2003

Summer Researcher and Clinic Program Team Member

Digital communication using OFDM

- Developed system-level simulations in SystemView, and introductory tutorials, to characterize effects of varying OFDM parameters in the 802.11a standard
- Investigated effectiveness of various peak-to-average power (PAPR) reduction methods for OFDM/FM modulation via simulations in MATLAB

Modeling the Loran-C navigation system

- Developed a model of the existing Loran-C (LONg Range Navigation), using MATLAB, via data acquisition, error modeling, and validation of the model
- Constructed analytical and MATLAB models to investigate the compatibility of Loran-C with GPS navigation

RELEVANT COURSEWORK

Adaptive Signal Processing	Error-Correcting Codes	Estimation Theory
Principles of Radar	Mobile Communications	Optimization Theory
Information Theory	Communication Theory	Random Processes
Intro to Computer Networks	Numerical Analysis	Applied Probability

AWARDS AND MEMBERSHIPS

- Best Applications Paper Award for “Optimal Allocation of Measurements for Multi-hypothesis Activity-Detection” at 5th IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), June 2009
- Presented KNOWME networks research at Body Computing Slam (**winner, Best Presentation**) as part of the 2009 Body Computing Conference, USC
- USC Viterbi School of Engineering Dean's Fellowship 2003-2004
- Member, Harvey Mudd College team selected as “Outstanding Winner” (top 4%) in 2003 Interdisciplinary Contest in Modeling (ICM 2003)
- Inducted into National Engineering Honor Society *Tau Beta Pi* (2002)

JOURNAL PUBLICATIONS

Gautam Thatte, Ming Li, Sangwon Lee, Adar Emken, Shri Narayanan, Urbashi Mitra, Donna Spruijt-Metz and Murali Annavaram, “KNOWME: An Energy-Efficient, Multimodal Body Area Network for Physical Activity Monitoring,” *ACM Transactions on Embedded Computing Systems*, *in press*.

Adar Emken, Ming Li, **Gautam Thatte**, Sangwon Lee, Murali Annavaram, Urbashi Mitra, Shrikanth Narayanan and Donna Spruijt-Metz, “Recognition of Physical Activities in Overweight Hispanic Youth using KNOWME Networks,” *Journal of Physical Activity and Health*, *in press*.

Gautam Thatte, Urbashi Mitra and John Heidemann, “Parametric Methods for Anomaly Detection in Aggregate Traffic,” *IEEE/ACM Transactions on Networking*, 19(2), 512-525, April 2011.

Gautam Thatte, Ming Li, Sangwon Lee, Adar Emken, Murali Annavaram, Shri Narayanan, Donna Spruijt-Metz and Urbashi Mitra, “Optimal Time-Resource Allocation for Energy-Efficient Physical Activity Detection,” *IEEE Transactions on Signal Processing*, 59(4), 1843-1857, April 2011.

Ming Li, Viktor Rozgic, **Gautam Thatte**, Sangwon Lee, Adar Emken, Murali Annavaram, Urbashi Mitra, Donna Spruijt-Metz and Shrikanth Narayanan, “Multimodal Physical Activity Recognition by Fusing Temporal and Cepstral Information,” *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 18(4), 369-380, August 2010.

Gautam Thatte and Urbashi Mitra, “Sensor Selection and Power Allocation for Distributed Estimation in Sensor Networks: Beyond the Star Topology,” *IEEE Transactions on Signal Processing*, 56(7), 2649-2661, July 2008.

Tara Martin, **Gautam Thatte** and Michael Vrable, “Special Section on the ICM – How I Learned to Stop Worrying and Find the Bomb,” *Journal of Undergraduate Mathematics and Its Applications (UMAP)*, 24(2), August 2003.

CONFERENCE PRESENTATIONS

Gautam Thatte, Ming Li, Adar Emken, Urbashi Mitra, Shri Narayanan, Murali Annavaram and Donna Spruijt-Metz, “Energy-Efficient Multi-hypothesis Activity-Detection for Health-Monitoring Applications,” *Engineering in Biology and Medicine Conference (EMBC)*, Minneapolis, MN, September 2009.

Gautam Thatte, Viktor Rozgic, Ming Li, Sabyasachi Ghosh, Urbashi Mitra, Shri Narayanan, Murali Annavaram and Donna Spruijt-Metz, “Optimal Allocation of Measurements for Multi-hypothesis Activity-Detection,” *5th IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS)*, Marina Del Rey, CA, June 2009 (*winner, Best Applications Paper Award*).

Gautam Thatte, Viktor Rozgic, Ming Li, Sabyasachi Ghosh, Urbashi Mitra, Shri Narayanan, Murali Annavaram, Donna Spruijt-Metz, “Optimal Time-Resource Allocation for Activity-Detection via Multimodal Sensing,” in *Proceedings of the Fourth International Conference on Body Area Networks (BodyNets)*, Los Angeles, CA, April 2009.

Gautam Thatte, Urbashi Mitra and John Heidemann, “Detection of Low-Rate Attacks in Computer Networks,” in Proceedings of the 11th IEEE Global Internet Symposium, Phoenix, AZ, April 2008.

Gautam Thatte and Urbashi Mitra, “Power Allocation in Linear and Tree WSN Topologies,” in Proceedings of 40th Asilomar Conference on Signals, Systems and Computers, Asilomar, CA, October 2006 (Invited paper).